

STATE OF MICHIGAN



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DEPARTMENT OF NATURAL RESOURCES

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Surface Water Quality Division
 Southeast Michigan District Headquarters
 38980 Seven Mile Road
 Livonia, Michigan 48152

May 6, 1991

US EPA RECORDS CENTER REGION 5



406685

Mr. Thomas Ray, Manager
 Environmental Affairs
 Atochem North America, Inc.
 17168 West Jefferson Ave.
 Riverview, Michigan 48192-4270

RE: Atochem
 NPDES MI0002381
 CSI-1990

Dear Mr. Ray:

On May 22 and 23, 1990, this office conducted a Compliance Sampling Inspection (CSI) at the Atochem North America, Inc., Organics Division Plant located at 17168 West Jefferson Avenue in Riverview, Michigan. The purpose of the inspection was to determine by sampling, site evaluation and records review your facility's compliance with National Pollutant Discharge Elimination System (NPDES) requirements. A copy of the sampling survey inspection report is attached for your review. Our comments on the records review and site evaluation portion of the inspection was transmitted to you on July 2, 1990.

Our samples met the NPDES permit, MI0002381, final effluent limitations during the survey with one exception. The daily maximum limits for total phenol, concentration and loading, were exceeded during the survey. The concentration limit is 9 ug/l and our composite sample contained 26 ug/l of total phenol. The loading was calculated to be 1.8 lbs/day while the limit is 1.1 lbs/day. The intake water contained 12 ug/l of total phenol during the same period.

Our composite sample of the effluent was split with you after the inspection. The analytical results of that sample from your laboratory as submitted to us on June 15, 1990 compare very well with the results from our laboratory.

Mr. Thomas Ray
May 6, 1991
Page 2

The effluent, in addition to the permit parameters, was analyzed for a number of pollutants including organic compounds, metals and nutrients. The pollutants were either below levels of detection or below levels of concern. The data will, however, be further reviewed by Division toxicologists and you will be advised if additional monitoring or regulation is needed.

The report also contains tabulated sample data from a CSI that was conducted at the plant on November 11 and 12, 1987. A review of our files found that this data had not previously been transmitted to you.

Thank you for your cooperation during the survey. Feel free to contact us if you have any questions.

Sincerely,



Roy E. Schrameck, Supervisor
Surface Water Quality Division
Southeast Michigan District
(313) 953-0241

by:



William E. Stone
Environmental Quality Analyst
(313) 953-1438

RES/WES
Enclosure
cc: Water Quality Studies
Water Quality Appraisal
Permits

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION BUREAU
SURFACE WATER QUALITY DIVISION

Report of a Compliance Sampling Inspection

Conducted at

ATOCHEM NORTH AMERICA, INC.

All Outfalls No.820298
NPDES Permit No. MI0002381

Wayne County
Wyandotte, Michigan

May 22, 1990

ATOCHEM

Inspection Comments

A Compliance Sampling Inspection (CSI) was conducted at ATOCHEM North America, Inc., Organics Division Plant, 171 Jefferson Avenue, Riverview, Michigan. Wastewater sampling was performed during one twenty-four hour survey period on May 22, 1990.

The survey results are compared to the facility's Pollutant Discharge Elimination System (NPDES) permit effluent limitations in Table 3 (page 14). The facility met the final permit limitations with one exception. The maximum limits for total phenol, concentration allowed exceeded during the survey. The concentration of total phenol in the composite sample contained 26 ug/l of total phenol. The loading rate was calculated to be 1.8 lbs/day using the recorded flow of 8.3 MGD. The limit was 1.1 lbs/day. The water contained 12 ug/l of total phenol during the survey.

The results of this survey are compared to the facility's self-monitoring results for May 22 and 23 in Table 2. The self-monitoring data as reported in the facility's Monitoring Reports is very similar to the survey results.

Table 3 also contains a summary of the facility's self-monitoring data for the period June 1, 1989 to June 1, 1990. When compared with our sampling results indicated that the inspection was done during a typical discharge. The summary shows, also, that the facility effluent is generally consistent and meets effluent limitations.

Samples of the plant final effluent (outfall 00) were analyzed for a variety of parameters. The concentrations were higher than those limited by the permit including metals and organic nutrients. The composite data are presented in Table 3 (pages 6 - 9). Table 2 (pages 10 - 13) gives the detailed results. All parameters were either below levels or above levels of concern.

Surficial sludge from Monguagon Creek near the plant was sampled and analyzed for metals and organics. The results are presented in Table 2 (pages 12 and 13).

Inspection Comments (cont.)

The composite sample collected from the effluent and the sludge sample from the creek were split with the permittee for a comparison of analytical results. The permittee's portions of the samples were analyzed for the parameters listed in Table 4 (page 15), in their laboratory. The other portions were analyzed at the Environmental Protection Bureau Laboratory in Lansing. The results of the effluent sample compare very well. However, our laboratory reported concentrations of metals in the sludge two to three times greater than those reported by the Company.

A CSI had previously been conducted at the plant on November 11 and 12, 1987. The composite data are from that survey are presented in Table 5 (pages 16 - 19). Table 2 (pages 20 - 24) gives the grab sample results from the effluent, the intake and river sludge. The results of this previous survey are nearly identical to the results of the May 22 and 23, 1990, CSI.

Plant Process

The Atochem North America, Inc., plant produces about 100 different compounds. Major products are alkylamines and rubber compounds which are made from ammonia and alcohols. The location of the plant is shown in Figure 1 (page 5).

Water Supply

All process and cooling water used in the plant is obtained through an intake on the Trenton Channel of the Detroit River. The raw water is chlorinated continuously during the summer, beginning in early May.

Domestic water is purchased from the City of Detroit. Sanitary wastes are discharged to the Detroit sanitary sewer system.

Wastewater Treatment System

All process and cooling waters at the plant are treated in a series of lagoons. A diagram of the treatment system is given in Figure 1 (page 5). Pond 1 receives wastes from the pilot plant operation. Phenolic wastes are batch discharged via a sump to Pond 2 for equalization. The waste is tested in the sump prior to discharge to the pond and if results are high the waste is bled to the pond or trucked off-site for disposal. These wastes are combined with other waste streams in Pond 3. The pH is

Wastewater Treatment System (cont.)

adjusted with acid or caustic prior to Pond 4 where oils are removed and final settling occurs. The effluent from Pond 4, the treated process wastes, is mixed with the cooling water (55% of total flow). Discharge of the combined effluent is to Monguagon Creek, a small tributary of the Trenton Channel of the Detroit River, via outfall 001.

Survey Procedure

The flows and samples were obtained as follows:

<u>Sample Location</u>	<u>Flow Measurement</u>	<u>Sampling Methods</u>
Intake at screens	-	automatic sampler grab composite individual grabs
Outfall 001 at outfall pipe	Facility DMR	automatic sampler grab composite individual grabs
Sludge at sheet piling just downstream of outfall pipe	-	individual grab

Composite samples for most parameters were collected with an ISCO automatic sampler. The extractable organic composite samples were grab composites consisting of three equal volume and evenly spaced individual grabs mixed into one sample container.

The automatic samplers collected and composited ~70 ml of sample into a single, new 8 liter plastic container every 15 minutes during the survey period. The sample delivery line was new 3/8 inch polyethylene tubing. The tubing in the sampler's peristaltic pump was clean new medical grade silicon tubing.

An individual grab is a single instantaneous sample. The grab samples were collected with clean glass and clean stainless steel samplers.

Survey Procedure (cont.)

Dissolved oxygen concentrations, temperature and pH were determined in the field. The pH meter, a Sargent-Welch Model PBL, was calibrated each day using pH buffers of 4, 7 and 10. The YSI Model 57 dissolved oxygen meter was calibrated daily using the air calibration technique and Winkler method. Calibrations were recorded in a journal. The total residual chlorine concentration was determined with a Fisher Porter amperometric titrator.

Samples were analyzed by the Environmental Protection Bureau Laboratories located in Lansing.

Samples were preserved according to Table 7 (page 25). Letter codes for laboratory results and symbols used in the report are defined in Table 7.

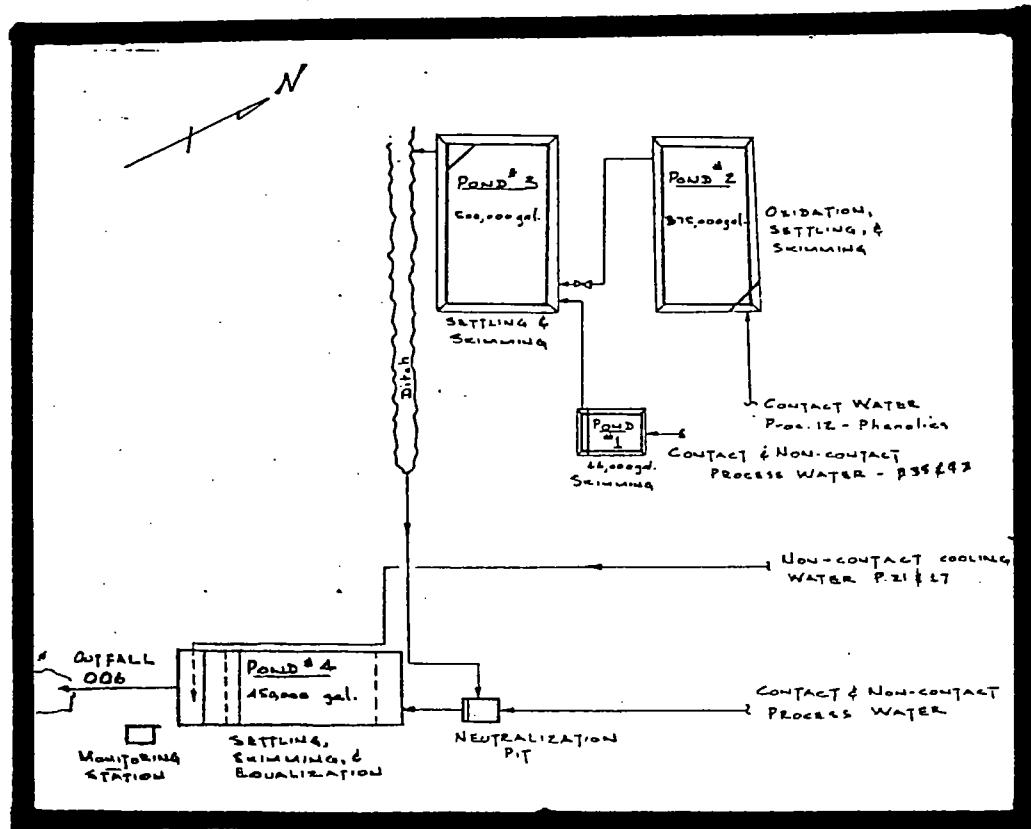
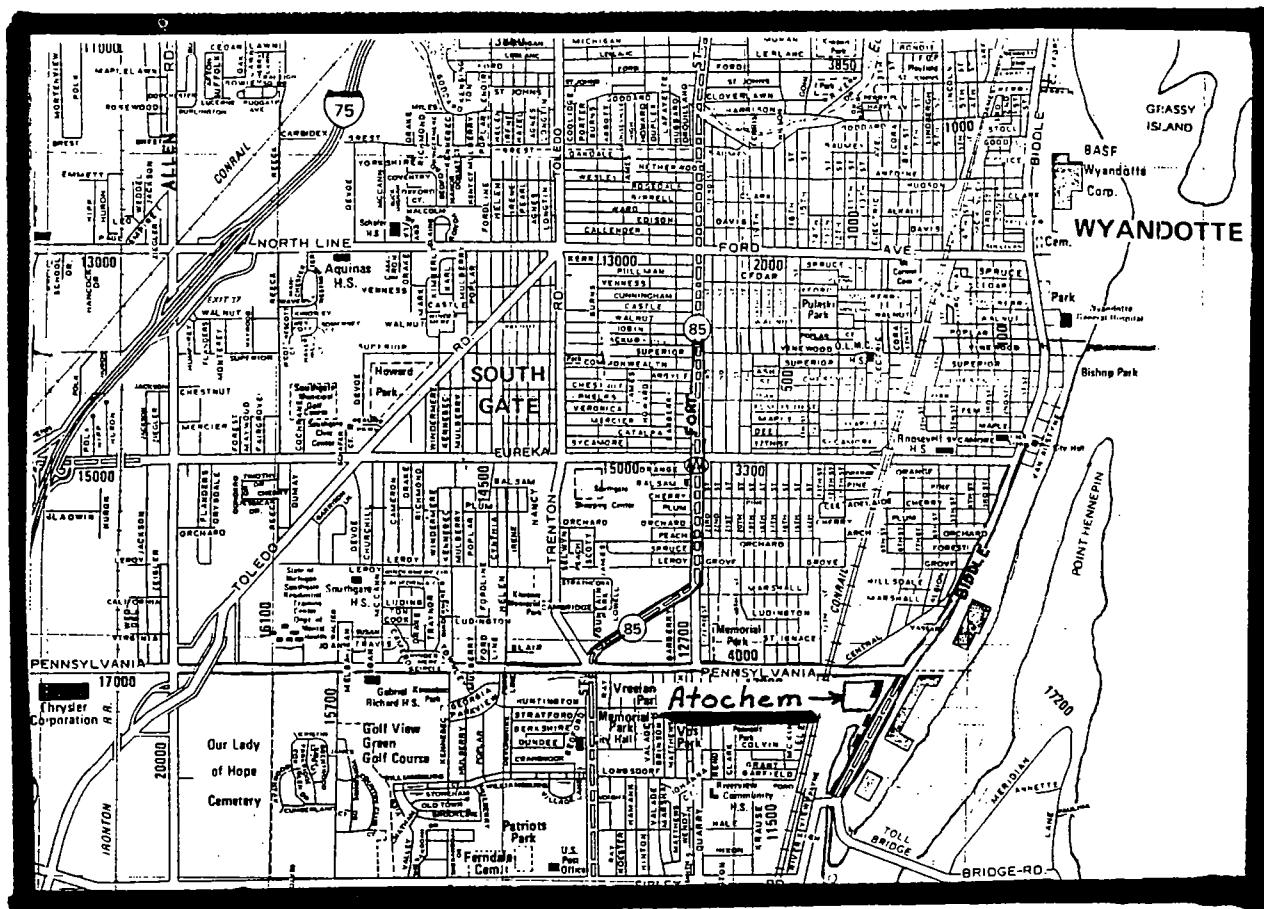


Figure 1:

Location of Atochem and diagram of treatment system.

TABLE 1 - Analyses of Composite Samples

Outfall	001	INTAKE
Survey Period From	05/22/90 0945	05/22/90 1015
To	05/23/90 0845	05/23/90 1400
Computed Flow Rate	8.3 MGD	

	mg/l	lbs/day	mg/l	lbs/day
Alkalinity (CaCO ₃)	81	NA	81	NA
BOD-5	20 LP	NA	4 LP	NA
CBOD-5	19	1315.2	-	NA
Calcium	28.6	1979.7	29.4	NA
Chloride	41	2838.1	16	NA
COD	21	1453.7	10	NA
Conductivity (uMHOS/cm)	359	NA	274	NA
Total Cyanide	<0.005	NA	<0.005	NA
Hardness (CaCO ₃)	104	NA	105	NA
Magnesium	7.8	539.9	7.6	NA
NO ₃ + NO ₂	0.35	24.2	0.34	NA
Ammonia as N	0.64	44.3	0.3	NA
Kjeldahl Nitrogen	2.3	159.2	0.78	NA
Orthophosphorus	-	NA	<0.01	NA
Total Phosphorus	0.11	7.6	0.04	NA
Reactive Silicon	0.69	47.8	0.65	NA
Suspended Solids	13	899.9	11	NA
Dissolved Solids	190	13152.2	160	NA
Sulfate	22	1522.9	19	NA
TOC	9.6	664.5	2.8	NA
Turbidity	6.1	422.3	6.1	NA

	ug/l	lbs/day	ug/l	lbs/day
Phenols (4AAP)	26	NA	12	NA
Total Silver (Ag)	-	NA	<0.5	NA
Total Cadmium (Cd)	0.9	NA	0.5	NA
Total Chromium (Cr)	1.2	NA	1	NA
Hexavalent Chromium (Cr+6)	<5	NA	<5	NA
Total Copper (Cu)	3.6	NA	3.2	NA
Total Mercury (Hg)	<0.5	NA	<0.5	NA
Total Nickel (Ni)	2.9	NA	3.5	NA
Total Lead (Pb)	1.7	NA	1.2	NA
Total Zinc (Zn)	27.2	NA	18	NA

ATOCHEM

TABLE 1 (cont.) - Analysis of Composite Samples

Outfall	001
Survey Period	From 05/22/90 0945
	To 05/23/90 0930
Computed Flow Rate	8.3 MGD

GC/MS Base/Neutrals

Dilution Factor	1.1	ug/l	lbs/day	<
Bis(2-chloroethyl)ether	<	2.2	NA	<
1,3-Dichlorobenzene	<	2.2	NA	<
1,4-Dichlorobenzene	<	2.2	NA	<
1,2-Dichlorobenzene	<	2.2	NA	<
Bis(2-chloroisopropyl)ether	<	5.5	NA	<
N-Nitroso-di-n-propylamine	<	5.5	NA	<
Hexachloroethane	<	5.5	NA	<
Nitrobenzene	<	2.2	NA	<
Isophorone	<	1.1	NA	<
Bis(2-chloroethoxy)methane	<	2.2	NA	<
1,2,4-Trichlorobenzene	<	2.2	NA	<
Naphthalene	<	1.1	NA	<
Hexachlorobutadiene	<	5.5	NA	<
Hexachlorocyclopentadiene	<	5.5	NA	<
2-Chloronaphthalene	<	2.2	NA	<
Dimethylphthalate	<	2.2	NA	<
Acenaphthylene	<	1.1	NA	<
2,6-Dinitrotoluene	<	5.5	NA	<
Acenaphthene	<	2.2	NA	<
2,4-Dinitrotoluene	<	5.5	NA	<
Fluorene	<	2.2	NA	<
Diethylphthalate	<	2.2	NA	<
4-Chlorodiphenyl ether	<	5.5	NA	<
N-Nitrosodiphenyl amine	<	2.2	NA	<
1,2-Diphenylhydrazine	<	2.2	NA	<
4-Bromodiphenyl ether	<	5.5	NA	<
Hexachlorobenzene	<	5.5	NA	<
Phenanthrene	<	1.1	NA	<
Anthracene	<	1.1	NA	<
Di-n-butylphthalate	<	1.1	NA	<
Fluoranthene	<	1.1	NA	<
* Benzidine	<	16.5	NA	<
Pyrene	<	1.1	NA	<
Butyl benzyl phthalate	<	2.2	NA	<
Benzo(a)anthracene	<	2.2	NA	<
* 3,3'-Dichlorobenzidine	<	11	NA	<
Chrysene	<	2.2	NA	<
Bis(2-ethylhexyl)phthalate	<	2.2	NA	<
Di-n-octylphthalate	<	2.2	NA	<
Benzo(b)fluoranthene	<	2.2	NA	<
Benzo(k)fluoranthene	<	2.2	NA	<
Benzo(a)pyrene	<	2.2	NA	<
Indeno(1,2,3-c,d)pyrene	<	5.5	NA	<
Dibenzo(a,h)anthracene	<	5.5	NA	<
Benzo(g,h,i)perylene	<	5.5	NA	<

* Seldomly encountered, reported semi-quantitatively.

TABLE 1 (cont.) - Analysis of Composite Samples

Outfall	001	INTAKE
Survey Period From	05/22/90 0945	05/22/90 1015
To	05/23/90 0930	05/23/90 1400
Computed Flow Rate	8.3 MGD	

Scan 3 - Chlorinated Hydrocarbons, PCBs & Organochlorine Pesticides

Dilution Factor	1.1	1		
	ug/l	lbs/day	ug/l	lbs/day
1,3-Dichlorobenzene	< 0.11	NA	< 0.1	NA
1,4-Dichlorobenzene	< 0.11	NA	< 0.1	NA
1,2-Dichlorobenzene	< 0.44	NA	< 0.1	NA
Hexachloroethane	< 0.011	NA	< 0.01	NA
1,3,5-Trichlorobenzene	< 0.044	NA	< 0.01	NA
1,2,4-Trichlorobenzene	< 0.66	NA	< 0.01	NA
1,2,3-Trichlorobenzene	< 0.22	NA	< 0.01	NA
Hexachlorobutadiene	< 0.011	NA	< 0.01	NA
1,2,4,5-Tetrachlorobenzene	< 0.011	NA	< 0.01	NA
Hexachlorocyclopentadiene	< 0.011	NA	< 0.01	NA
2-Chloronaphthalene	< 0.22	NA	< 0.2	NA
1,2,3,4-Tetrachorobenzene	< 0.011	NA	< 0.01	NA
Pentachlorobenzene	< 0.011	NA	< 0.01	NA
a-BHC	< 0.011	NA	< 0.01	NA
Hexachlorobenzene	< 0.011	NA	< 0.01	NA
b-BHC	< 0.011	NA	< 0.01	NA
g-BHC (lindane)	< 0.011	NA	< 0.01	NA
Pentachloronitrobenzene	< 0.011	NA	< 0.01	NA
d-BHC	< 0.011	NA	< 0.01	NA
Heptachlor	< 0.011	NA	< 0.01	NA
Aldrin	< 0.011	NA	< 0.01	NA
Heptachlor epoxide	< 0.011	NA	< 0.01	NA
g-Chlordane	< 0.011	NA	< 0.01	NA
Endosulfan I	< 0.011	NA	< 0.01	NA
a-Chlordane	< 0.011	NA	< 0.01	NA
4,4'-DDE	< 0.011	NA	< 0.01	NA
Endrin	< 0.011	NA	< 0.01	NA
Dieldrin	< 0.22	NA	< 0.01	NA
4,4'-DDD	< 0.011	NA	< 0.01	NA
1,4'-DDT	< 0.011	NA	< 0.01	NA
4,4'-DDT	< 0.011	NA	< 0.01	NA
Hexabromobenzene	< 0.011	NA	< 0.01	NA
Methoxychlor	< 0.011	NA	< 0.01	NA
Mirex	< 0.011	NA	< 0.01	NA
Aroclor 1242	< 0.055	NA	< 0.05	NA
Aroclor 1254	< 0.055	NA	< 0.05	NA
Aroclor 1260	< 0.055	NA	< 0.05	NA
*Aroclor 1016	< 0.055	NA	< 0.05	NA
*Aroclor 1221	< 0.055	NA	< 0.05	NA
*Aroclor 1232	< 0.055	NA	< 0.05	NA
*Aroclor 1248	< 0.055	NA	< 0.05	NA
*Aroclor 1262	< 0.055	NA	< 0.05	NA
*Aroclor 1268	< 0.055	NA	< 0.05	NA
BP-6 (PBB)	< 0.055	NA	< 0.05	NA
*Toxaphene	< 0.055	NA	< 0.05	NA

* Seldomly encountered, reported semi-quantitatively

TABLE 1 (cont.) - Analysis of Composite Samples

Outfall Survey Period	From To	001 05/22/90 0945 05/23/90 0930	INTAKE 05/22/90 1015 05/23/90 1400
Computed Flow Rate		8.3 MGD	

Scan 8 - Phenols

Dilution Factor	1.1	1.1		
	ug/l	lbs/day	ug/l	lbs/day
Phenol	<	11	NA	< 11 NA
2-Chlorophenol	<	11	NA	< 11 NA
2-Nitrophenol	<	11	NA	< 11 NA
2,4-Dimethylphenol	<	11	NA	< 11 NA
2,4-Dichlorophenol	<	11	NA	< 11 NA
4-Chloro-3-methylphenol	<	11	NA	< 11 NA
* 3-Phenylpropionic acid	<	44	NA	< 44 NA
2,4,6-Trichlorophenol	<	11	NA	< 11 NA
2,4,5-Trichlorophenol	<	11	NA	< 11 NA
2,4-Dinitrophenol	<	270	NA	< 270 NA
4-Nitrophenol	<	110	NA	< 110 NA
2-Methyl-4,6-dinitrophenol	<	110	NA	< 110 NA
Pentachlorophenol	<	110	NA	< 110 NA

* Seldom encountered, reported semi-quantitatively.

TABLE 2 - Analyses of Grab Samples

Outfall	001	001	001	INTAKE
Date Collected	05/22/90	05/22/90	05/23/90	05/22/90
Time Collected	0945	2130	0930	1015

	mg/l	mg/l	mg/l	mg/l
Temperature (F)	70	72	72	58
pH (S.U.)	7	7	-	6.9
Chlorine (Cl2)	0	0	0	0
Dissolved Oxygen	8.1	8.4	8.1	10.1
BOD-5	10	22	30	-
COD	14	18	40	6
NO ₃ + NO ₂	0.94	0.35	0.51	0.35
Ammonia as N	0.71	0.66	0.53	0.3
Kjeldahl Nitrogen	2.1	3.2	4.6	0.6
Total Phosphorus	0.06	0.36	0.18	0.03
Suspended Solids	13	14	15	9
Dissolved Solids	170	150	2200	100
TOC	6.8	13	21	2.4
Turbidity	6.5	5.6	6	5.7

	ug/l	ug/l	ug/l	ug/l
Phenols (4AAP)	33	17	10	2.5
Total Cadmium (Cd)	1.2	0.3	0.2	0.4
Total Chromium (Cr)	<1	<1	1.2	1.1
Total Copper (Cu)	4.1	2.7	2.7	2.7
Total Mercury (Hg)	<0.5	<0.5	<0.5	<0.5
Total Nickel (Ni)	3.1	2.3	2.2	3.4
Total Lead (Pb)	1.4	1.5	1.3	1.5
Total Zinc (Zn)	36.1	32.8	20.2	11.5

Outfall	INTAKE
Date Collected	05/23/90
Time Collected	0830

	mg/l
Temperature (F)	56
pH (S.U.)	7.1
Chlorine (Cl2)	0
Dissolved Oxygen	10

TABLE 2 (cont.) - Analysis of Grab Samples

Outfall	001	001	001	INTAKE
Date Collected	05/22/90	05/22/90	05/23/90	05/22/90
Time Collected	0945	2130	0930	1015

Scan 1 - Purgeable Halocarbons

Dilution Factor	1	1	1	1
	ug/l	ug/l	ug/l	ug/l
Vinyl chloride	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5
Trichlorofluoromethane	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 1	< 1	< 1	< 1
Methylene chloride	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	< 1	< 1	< 1	< 1
1,1-Dichloroethane	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	< 1	< 1	< 1	< 1
Chloroform	8.6 UC	5.2 UC	4.7 UC	< 1
1,1,1-Trichloroethane	< 1	< 1	< 1	< 1
Carbon Tetrachloride	< 1	< 1	< 1	< 1
1,2-Dichloroethane	< 1	< 1	< 1	< 1
Trichloroethene	< 1	< 1	< 1	< 1
1,2-Dichloropropane	< 1	< 1	< 1	< 1
Bromodichloromethane	< 1	< 1	< 1	< 1
cis-1,3-Dichloropropene	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	< 1	< 1	< 1	< 1
Tetrachloroethene	< 1	< 1	< 1	< 1
Dibromochloromethane	2.7 UC	2.9 UC	3.5 UC	< 1
Chlorobenzene	< 5	< 5	< 5	< 5
Bromoform	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	< 1	< 1	< 1	< 1

Scan 2 - Purgeable Aromatic Hydrocarbons

Dilution Factor	1	1	1	1
	ug/l	ug/l	ug/l	ug/l
Benzene	< 1	< 1	< 1	< 1
Toluene	< 1	< 1	< 1	< 1
Ethylbenzene	< 1	< 1	< 1	< 1
Xylene isomers (o, m, and p)	< 1	< 1	< 1	< 1

TABLE 2 (cont.) - Analyses of Grab Samples

Type of Sludge	MONGUAGON CREEK SEDIMENT
Date Collected	05/23/90
Time Collected	0930
-----	-----
Total Solids - Inorganic (%TS)	33.7
Cadmium in Sediment (mg/kg) dry	6.1
Chromium in Sediment (mg/kg) dry	183
Copper in Sediment (mg/kg) dry	148
Mercury in Sediment (mg/kg) dry	2.2
Nickel in Sediment (mg/kg) dry	300
Lead in Sediment (mg/kg) dry	174
Zinc in Sediment (mg/kg) dry	3000
Phenolics in Sediment (mg/kg) dry	2.1

TABLE 2 (cont.) - Analysis of Grab Samples

Outfall	MONGUAGON CREEK
	SEDIMENT
Date Collected	05/23/90
Time Collected	0930

GC/MS Base/Neutrals

Dilution Factor	500 ug/Kg
Bis(2-chloroethyl)ether	< 1000
1,3-Dichlorobenzene	< 1000
1,4-Dichlorobenzene	< 1000
1,2-Dichlorobenzene	< 1000
Bis(2-chloroisopropyl)ether	< 2500
N-Nitroso-di-n-propylamine	< 2500
Hexachloroethane	< 2500
Nitrobenzene	< 1000
Isophorone	< 500
Bis(2-chloroethoxy)methane	< 1000
1,2,4-Trichlorobenzene	< 1000
Naphthalene	< 500
Hexachlorobutadiene	< 2500
Hexachlorocyclopentadiene	< 2500
2-Chloronaphthalene	< 1000
Dimethylphthalate	< 1000
Acenaphthylene	< 500
2,6-Dinitrotoluene	< 2500
Acenaphthene	< 1000
2,4-Dinitrotoluene	< 2500
Fluorene	< 1000
Diethylphthalate	< 1000
4-Chlorodiphenyl ether	< 2500
N-Nitrosodiphenyl amine	< 1000
1,2-Diphenylhydrazine	< 1000
4-Bromodiphenyl ether	< 2500
Hexachlorobenzene	< 2500
Phenanthrene	< 500
Anthracene	< 500
Di-n-butylphthalate	< 500
Fluoranthene	< 500
* Benzidine	< 7500
Pyrene	< 500
Butyl benzyl phthalate	< 1000
Benzo(a)anthracene	< 1000
* 3,3'-Dichlorobenzidine	< 5000
Chrysene	< 1000
Bis(2-ethylhexyl)phthalate	2300
Di-n-octylphthalate	< 1000
Benzo(b)fluoranthene	< 1000
Benzo(k)fluoranthene	< 1000
Benzo(a)pyrene	< 1000
Indeno(1,2,3-c,d)pyrene	< 2500
Dibenzo(a,h)anthracene	< 2500
Benzo(g,h,i)perylene	< 2500
* Seldomly encountered, reported semi-quantitatively.	

TABLE 3 - Comparison of survey results with the facility's NPDES Permit and with self-monitoring data from May 1990 and the previous year.

Outfall/Parameter (Unit)	Final Effluent Limitations				May Discharge Monitoring Report						Survey Results		June 1, 1989 to June 1, 1990 Summary of Self-Monitoring Data				
	30-day Avg.	7-day Avg.	Daily Min.	Daily Max.	Monthly Average	Monthly Maximum	Monthly Minimum	7-day Average	05/22/90	05/23/90	Composite	Grab	Year Average	Highest Monthly Average	Lowest Monthly Average	Year Maximum	Year Minimum
	-	-	-	-	8.1	8.9	-	-	8.3	7.5	-	-	8.8	12.1	7.3	14	-
Outfall 001																	
Flow (MGD)	-	-	-	-	8.1	8.9	-	-	8.3	7.5	-	-	8.8	12.1	7.3	14	-
Suspended solids (lbs/d)	1568	-	-	4525	717	1329	-	-	1175	-	899	-	800	1221	257	2534	-
Temperature (F)	-	-	-	-	73	-	-	-	-	75	-	-	70,72,72	-	73	47	-
BOD5 (lbs/d)	1039	-	-	2773	538	2099	-	-	-	1000	1384	-	610	1374	353	6697	-
Chlorides (mg/l)	-	-	-	-	38	-	-	-	39	-	41	-	32	58	11	-	-
Total phenol (ug/l)	4	-	-	9	1.6	1.6	-	-	-	-	26	-	2	6.2	0.29	18	-
Total phenol (lbs/d)	0.45	-	-	1.1	0.08	0.08	-	-	-	-	1.8	-	0.16	0.38	0.07	1.2	-
Ammonia as N (mg/l)	-	-	-	-	0.69	-	-	-	-	-	0.64	-	0.6	0.92	0.42	-	-
Total residual chlorine(mg/l)	-	-	-	0.036	-	0	-	-	-	0.005	-	0,0,0	0.008	-	-	0.04	0
Dissolved oxygen (mg/l)	-	-	-	4	-	-	-	-	-	8	-	8.1,8.4,8.1	-	-	-	-	7
pH (SU)	-	-	6.5	9	-	9	6.8	-	7.6	7.4	-	7,7	-	-	-	10.1	6
Total zinc (ug/l)	105	-	-	190	15	20	-	-	-	-	27.2	-	23	35	15	50	-
Total zinc (lbs/d)	12.9	-	-	29.3	1	1.4	-	-	-	-	1.8	-	1.9	2.9	2	4.8	-
INTAKE																	
Suspended solids (mg/l)	-	-	-	-	13	13	-	-	10	-	11	-	14.5	24	5	50	-
Suspended solids (lbs/d)	-	-	-	-	841	1963	-	-	691	-	761	-	555	841	341	1963	-
BOD5 (mg/l)	-	-	-	-	1	3	-	-	-	3	4	-	1.4	2	1	3	-
BOD5 (lbs/d)	-	-	-	-	99	187	-	-	-	187	276	-	88.4	101	77	190	-
Chlorides (mg/l)	-	-	-	-	17	20	-	-	17	-	16	-	17	28	11	48	-

Table 4 - Comparison of the laboratory analytical results obtained by the facility and the Environmental Protection Bureau (EPB) from the split samples.

Outfall	001	MONGUAGON CREEK SEDIMENT	
Sample type	composite	grab	
Date & Time collected	from to	05/22/90 0945 05/23/90 0845	05/23/90 0930
Parameter (unit)	Facility results	E.P.B. results	Facility results
	-----	-----	-----
	mg/l	mg/l	mg/kg
BOD-5	19.0	19	-
Chloride	40.6	41	-
Ammonia as N	1.5	0.64	-
Suspended Solids	13.5	13	-
	ug/l	ug/l	mg/kg
Phenols (4AAP)	<260	26	-
Total Cadmium (Cd)	-	-	3.0 6.1
Total Chromium (Cr)	-	-	56.0 183
Total Copper (Cu)	-	-	59.0 148
Total Nickel (Ni)	-	-	130.0 300
Total Lead (Pb)	-	-	70.0 174
Total Zinc (Zn)	120	27.2	780 3000

TABLE 5 - Analyses of Composite Samples from 1987

Outfall	001	INTAKE
Survey Period From	11/02/87 1200	11/02/87 1245
To	11/03/87 1115	11/03/87 1140
Computed Flow Rate	11.5 MGD	

	mg/l	lbs/day	mg/l	lbs/day
Alkalinity (CaCO ₃)	95	NA	92	NA
BOD-5	14	1342.7	<2	NA
Calcium	29.6	2838.9	26.9	NA
Chloride	37	3548.7	12.5	NA
COD	16	1534.6	4	NA
Total Cyanide	<0.005	NA	<0.005	NA
Magnesium	8.1	776.9	7.7	NA
NO ₃ + NO ₂	0.34 HT	NA	0.27 HT	NA
Ammonia as N	0.29 HT	NA	0.2 HT	NA
Kjeldahl Nitrogen	1.54 HT	NA	0.43 HT	NA
Total Phosphorus	0.12 HT	NA	0.03 HT	NA
Suspended Solids	10	959.1	9	NA
Dissolved Solids	188	18031.1	148	NA
Sulfate	22	2110.0	16.4	NA
TOC	8.2 HT	NA	2.1 HT	NA

	ug/l	lbs/day	ug/l	lbs/day
Phenols (4AAP)	24	NA	<10	NA
Total Cadmium (Cd)	<20	NA	<20	NA
Total Chromium (Cr)	<50	NA	<50	NA
Hexavalent Chromium (Cr+6)	<5	NA	<5	NA
Total Copper (Cu)	<20	NA	<20	NA
Total Mercury (Hg)	<0.5	NA	<0.5	NA
Total Nickel (Ni)	<50	NA	<50	NA
Total Lead (Pb)	<50	NA	<50	NA
Total Zinc (Zn)	<50	NA	<50	NA

TABLE 5 (cont.) - Analysis of Composite Samples from 1987

Outfall		001		INTAKE
Survey Period	From	11/02/87	1200	11/02/87
	To	11/03/87	1115	11/03/87
Computed Flow Rate		11.5 MGD		11.40

GC/MS Base/Neutrals

Dilution Factor		1 ug/l	lbs/day	1.1 ug/l	lbs/day
Bis(2-chloroethyl)ether	<	2	NA	<	2.2 NA
1,3-Dichlorobenzene	<	2	NA	<	2.2 NA
1,4-Dichlorobenzene	<	2	NA	<	2.2 NA
1,2-Dichlorobenzene	<	2	NA	<	2.2 NA
Bis(2-chloroisopropyl)ether	<	5	NA	<	5.5 NA
N-Nitroso-di-n-propylamine	<	5	NA	<	5.5 NA
Hexachloroethane	<	5	NA	<	5.5 NA
Nitrobenzene	<	2	NA	<	2.2 NA
Isophorone	<	1	NA	<	1.1 NA
Bis(2-chloroethoxy)methane	<	2	NA	<	2.2 NA
1,2,4-Trichlorobenzene	<	2	NA	<	2.2 NA
Naphthalene	<	1	NA	<	1.1 NA
Hexachlorobutadiene	<	5	NA	<	5.5 NA
Hexachlorocyclopentadiene	<	5	NA	<	5.5 NA
2-Chloronaphthalene	<	2	NA	<	2.2 NA
Dimethylphthalate	<	2	NA	<	2.2 NA
Acenaphthylene	<	1	NA	<	1.1 NA
2,6-Dinitrotoluene	<	5	NA	<	5.5 NA
Acenaphthene	<	2	NA	<	2.2 NA
2,4-Dinitrotoluene	<	5	NA	<	5.5 NA
Fluorene	<	2	NA	<	2.2 NA
Diethylphthalate	<	2	NA	<	2.2 NA
4-Chlorodiphenyl ether	<	5	NA	<	5.5 NA
N-Nitrosodiphenyl amine	<	2	NA	<	2.2 NA
1,2-Diphenylhydrazine	<	2	NA	<	2.2 NA
4-Bromodiphenyl ether	<	5	NA	<	5.5 NA
Hexachlorobenzene	<	5	NA	<	5.5 NA
Phenanthrene	<	1	NA	<	1.1 NA
Anthracene	<	1	NA	<	1.1 NA
Di-n-butylphthalate	<	1	NA	<	1.1 NA
Fluoranthene	<	1	NA	<	1.1 NA
* Benzidine	<	15	NA	<	16.5 NA
Pyrene	<	1	NA	<	1.1 NA
Butyl benzyl phthalate	<	2	NA	<	2.2 NA
Benzo(a)anthracene	<	2	NA	<	2.2 NA
* 3,3'-Dichlorobenzidine	<	10	NA	<	11 NA
Chrysene	<	2	NA	<	2.2 NA
Bis(2-ethylhexyl)phthalate	<	2	NA	<	2.2 NA
Di-n-octylphthalate	<	2	NA	<	2.2 NA
Benzo(b)fluoranthene	<	2	NA	<	2.2 NA
Benzo(k)fluoranthene	<	2	NA	<	2.2 NA
Benzo(a)pyrene	<	2	NA	<	2.2 NA
Indeno(1,2,3-c,d)pyrene	<	5	NA	<	5.5 NA
Dibenzo(a,h)anthracene	<	5	NA	<	5.5 NA
Benzo(g,h,i)perylene	<	5	NA	<	5.5 NA

* Seldomly encountered, reported semi-quantitatively.

TABLE 5 (cont.) - Analysis of Composite Samples from 1987

Outfall	001			INTAKE	
Survey Period	From	11/02/87	1200	11/02/87	1245
	To	11/03/87	1115	11/03/87	1140
Computed Flow Rate		11.5 MGD			

Scan 3 - Chlorinated Hydrocarbons, PCBs & Organochlorine Pesticides

Dilution Factor	1	1.1	1	1.1
	ug/l	lbs/day	ug/l	lbs/day
1,3-Dichlorobenzene	< 0.1	NA	< 0.11	NA
1,4-Dichlorobenzene	0.49	NA	< 0.11	NA
1,2-Dichlorobenzene	< 0.44	NA	< 0.11	NA
Hexachloroethane	< 0.01	NA	< 0.011	NA
1,3,5-Trichlorobenzene	< 0.044	NA	< 0.011	NA
1,2,4-Trichlorobenzene	< 0.66	NA	< 0.011	NA
1,2,3-Trichlorobenzene	< 0.22	NA	< 0.011	NA
Hexachlorobutadiene	< 0.01	NA	< 0.011	NA
1,2,4,5-Tetrachlorobenzene	< 0.01	NA	< 0.011	NA
Hexachlorocyclopentadiene	< 0.01	NA	< 0.011	NA
2-Chloronaphthalene	< 0.2	NA	< 0.22	NA
1,2,3,4-Tetrachlorobenzene	< 0.01	NA	< 0.011	NA
Pentachlorobenzene	< 0.01	NA	< 0.011	NA
a-BHC	< 0.01	NA	< 0.011	NA
Hexachlorobenzene	< 0.01	NA	< 0.011	NA
b-BHC	< 0.01	NA	< 0.011	NA
g-BHC (lindane)	< 0.01	NA	< 0.011	NA
Pentachloronitrobenzene	< 0.01	NA	< 0.011	NA
d-BHC	< 0.01	NA	< 0.011	NA
Heptachlor	< 0.01	NA	< 0.011	NA
Aldrin	< 0.01	NA	< 0.011	NA
Heptachlor epoxide	< 0.01	NA	< 0.011	NA
g-Chlordane	< 0.01	NA	< 0.011	NA
Endosulfan I	< 0.01	NA	< 0.011	NA
a-Chlordane	< 0.01	NA	< 0.011	NA
4,4'-DDE	< 0.01	NA	< 0.011	NA
Endrin	< 0.01	NA	< 0.011	NA
Dieldrin	< 0.22	NA	< 0.011	NA
4,4'-DDD	< 0.01	NA	< 0.011	NA
1,4'-DDT	< 0.01	NA	< 0.011	NA
4,4'-DDT	< 0.01	NA	< 0.011	NA
Hexabromobenzene	< 0.01	NA	< 0.011	NA
Methoxychlor	< 0.01	NA	< 0.011	NA
Mirex	< 0.01	NA	< 0.011	NA
Aroclor 1242	< 0.05	NA	< 0.055	NA
Aroclor 1254	< 0.05	NA	< 0.055	NA
Aroclor 1260	< 0.05	NA	< 0.055	NA
*Aroclor 1016	< 0.05	NA	< 0.055	NA
*Aroclor 1221	< 0.05	NA	< 0.055	NA
*Aroclor 1232	< 0.05	NA	< 0.055	NA
*Aroclor 1248	< 0.05	NA	< 0.055	NA
*Aroclor 1262	< 0.05	NA	< 0.055	NA
*Aroclor 1268	< 0.05	NA	< 0.055	NA
BP-6 (PBB)	< 0.05	NA	< 0.055	NA
*Toxaphene	< 0.05	NA	< 0.055	NA

* Seldomly encountered, reported semi-quantitatively

TABLE 5 (cont.) - Analysis of Composite Samples from 1987

Outfall	001	INTAKE
Survey Period	From 11/02/87 1200	11/02/87 1245
	To 11/03/87 1115	11/03/87 1140
Computed Flow Rate	11.5 MGD	

Scan 8 - Phenols

Dilution Factor	1.1	1	
	ug/l	lbs/day	ug/l
			lbs/day
Phenol	<	11	NA
2-Chlorophenol	<	11	NA
2-Nitrophenol	<	11	NA
2,4-Dimethylphenol	<	11	NA
2,4-Dichlorophenol	<	11	NA
4-Chloro-3-methylphenol	<	11	NA
* 3-Phenylpropionic acid	<	44	NA
2,4,6-Trichlorophenol	<	11	NA
2,4,5-Trichlorophenol	<	11	NA
2,4-Dinitrophenol	<	44	NA
4-Nitrophenol	<	44	NA
2-Methyl-4,6-dinitrophenol	<	44	NA
Pentachlorophenol	<	44	NA

* Seldom encountered, reported semi-quantitatively.

TABLE 6 - Analyses of Grab Samples from 1987

Outfall	001	001	001	001
Date Collected	11/02/87	11/02/87	11/03/87	11/03/87
Time Collected	1210	1510	0910	1105

	mg/l	mg/l	mg/l	mg/l
Dissolved Oxygen	9.6	9.5	9	-
BOD-5	7 LC	13 LC	5 LC	16 LC
COD	16	17	9	30
N03 + N02	0.34 HT	0.33 HT	0.32 HT	0.35 HT
Ammonia as N	0.3 HT	0.31 HT	0.28 HT	0.31 HT
Kjeldahl Nitrogen	1.13 HT	1.38 HT	0.85 HT	3.1 HT
Oil and Grease	4.7	3.6	<2	2.3
Total Phosphorus	0.06 HT	0.05 HT	0.05 HT	0.32 HT
Suspended Solids	13	8	10	20
Dissolved Solids	228	180	200	196
TOC	6.4 HT	7.8 HT	4.4 HT	13 HT

Outfall	INTAKE	INTAKE	INTAKE	INTAKE
Date Collected	11/02/87	11/02/87	11/03/87	11/03/87
Time Collected	1250	1540	0945	1135

	mg/l	mg/l	mg/l	mg/l
Dissolved Oxygen	11	10.8	11	-
BOD-5	<2	<2	<2	<2
COD	3	<3	3	<3
N03 + N02	0.27 HT	0.27 HT	0.27 HT	0.26 HT
Ammonia as N	0.18 HT	0.16 HT	0.24 HT	0.24 HT
Kjeldahl Nitrogen	0.5 HT	0.38 HT	0.45 HT	0.41 HT
Oil and Grease	3.1	2.7	<2	3.3
Total Phosphorus	0.03 HT	0.02 HT	0.03 HT	0.03 HT
Suspended Solids	9	10	10	10
Dissolved Solids	176	152	148	148
TOC	2.1 HT	2.1 HT	2.3 HT	2.1 HT

TABLE 6 (cont.) - Analysis of Grab Samples from 1987

Outfall	001	001	INTAKE	INTAKE
Date Collected	11/02/87	11/02/87	11/02/87	11/02/87
Time Collected	1210	1510	1250	1540

Scan 1 - Purgeable Halocarbons

Dilution Factor	1	1	1	1
	ug/l	ug/l	ug/l	ug/l
Vinyl chloride	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5
Trichlorofluoromethane	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 1	< 1	< 1	< 1
Methylene chloride	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	< 1	< 1	< 1	< 1
1,1-Dichloroethane	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	< 1	< 1	< 1	< 1
Chloroform	2.5	3	< 1	< 1
1,1,1-Trichloroethane	< 1	< 1	< 1	< 1.2 INT
Carbon Tetrachloride	< 1	< 1	< 1	< 1
1,2-Dichloroethane	< 1	< 1	< 1	< 1
Trichloroethene	< 1	< 1	< 1	< 1
1,2-Dichloropropane	< 1	< 1	< 1	< 1
Bromodichloromethane	< 1	< 1	< 1	< 1
cis-1,3-Dichloropropene	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	8.5	8.5	< 1	< 1
Tetrachloroethene	< 1	< 1	< 1	< 1
Dibromochloromethane	2	1.8	< 1	< 1
Chlorobenzene	< 5	< 5	< 5	< 5
Bromoform	< 1	1.1	< 1	< 1
1,1,2,2-Tetrachloroethane	< 1	< 1	< 1	< 1

Scan 2 - Purgeable Aromatic Hydrocarbons

Dilution Factor	1	1	1	1
	ug/l	ug/l	ug/l	ug/l
Benzene	< 1	< 1	< 1	< 1
Toluene	< 1	< 1	< 1	< 1
Ethylbenzene	< 1	< 1	< 1	< 1
Xylene isomers (o, m, and p)	1.5 UC	1.4 UC	< 1	< 1

TABLE 6 (cont.) - Analyses of Grab Samples from 1987

Type of Sludge	MONGUAGON CREEK SEDIMENT
Date Collected	11/03/87
Time Collected	0930
COD in Sediment (mg/kg) dry	180000
Kjeldahl nitrogen in Sediment (mg/kg) dry	2900
Total phosphorus in Sediment (mg/kg) dry	55
Phenolics in Sediment (mg/kg) dry	12

TABLE 6 (cont.) - Analysis of Grab Samples from 1987

Outfall	MONGUAGON CREEK
	SEDIMENT
Date Collected	11/03/87
Time Collected	0930

GC/MS Base/Neutrals

Dilution Factor	125 ug/Kg
Bis(2-chloroethyl)ether	< 250
1,3-Dichlorobenzene	< 250
1,4-Dichlorobenzene	< 250
1,2-Dichlorobenzene	< 250
Bis(2-chloroisopropyl)ether	< 625
N-Nitroso-di-n-propylamine	< 625
Hexachloroethane	< 625
Nitrobenzene	< 250
Isophorone	< 125
Bis(2-chloroethoxy)methane	< 250
1,2,4-Trichlorobenzene	< 250
Naphthalene	1800
Hexachlorobutadiene	< 625
Hexachlorocyclopentadiene	< 625
2-Chloronaphthalene	< 250
Dimethylphthalate	< 250
Acenaphthylene	< 125
2,6-Dinitrotoluene	< 625
Acenaphthene	< 250
2,4-Dinitrotoluene	< 625
Fluorene	< 250
Diethylphthalate	< 250
4-Chlorodiphenyl ether	< 625
N-Nitrosodiphenyl amine	< 250
1,2-Diphenylhydrazine	< 250
4-Bromodiphenyl ether	< 625
Hexachlorobenzene	< 625
Phenanthrene	< 125
Anthracene	< 125
Di-n-butylphthalate	< 125
Fluoranthene	< 125
* Benzidine	< 1875
Pyrene	< 125
Butyl benzyl phthalate	< 250
Benzo(a)anthracene	< 250
* 3,3'-Dichlorobenzidine	< 1250
Chrysene	< 250
Bis(2-ethylhexyl)phthalate	< 250
Di-n-octylphthalate	< 250
Benzo(b)fluoranthene	< 250
Benzo(k)fluoranthene	< 250
Benzo(a)pyrene	< 250
Indeno(1,2,3-c,d)pyrene	< 625
Dibenzo(a,h)anthracene	< 625
Benzo(g,h,i)perylene	< 625

* Seldomly encountered, reported semi-quantitatively.

TABLE 6 (cont.) - Analysis of Grab Samples from 1987

Outfall

MONGUAGON CREEK
SEDIMENT

Sample collection date and time 11/03/87 0930

Scan 3 - Chlorinated Hydrocarbons, PCBs &
Organochlorine Pesticides

Dilution Factor		12000	
	ug/l		lbs/day
1,3-Dichlorobenzene	<	1200	NA
1,4-Dichlorobenzene	<	1200	NA
1,2-Dichlorobenzene	<	1200	NA
Hexachloroethane	<	120	NA
1,2,4-Trichlorobenzene	<	120	NA
Hexachlorobutadiene	<	120	NA
2-Chloronaphthalene	<	1200	NA
Hexachlorobenzene	<	160	NA
g-BHC (lindane)	<	120	NA
Pentachloronitrobenzene	<	120	NA
d-BHC	<	120	NA
Heptachlor	<	140	NA
Aldrin	<	120	NA
Heptachlor epoxide	<	120	NA
g-Chlordane	<	120	NA
a-Chlordane	<	120	NA
4,4'-DDE	<	120	NA
4,4'-DDD	<	120	NA
1,4'-DDT	<	120	NA
4,4'-DDT	<	120	NA
Hexabromobenzene	<	120	NA
Methoxychlor	<	120	NA
Mirex		190 PS	NA
Aroclor 1242	<	1200	NA
Aroclor 1254	<	1200	NA
Aroclor 1260	<	1200	NA
*Aroclor 1016	<	1200	NA
*Aroclor 1221	<	1200	NA
*Aroclor 1232	<	1200	NA
*Aroclor 1248	<	1200	NA
*Aroclor 1262	<	1200	NA
*Aroclor 1268	<	1200	NA
BP-6 (PBB)	<	120	NA
*Toxaphene	<	1200	NA

* Seldomly encountered, reported semi-quantitatively

Table 7 - Sample Preservation

Parameter	Preservative
COD/TOC/Phenol/Nutrients (Chlorine Absent)	5 drops conc. H ₂ SO ₄ /250 ml (to pH <2)
Phenols (Chlorine Present)	Dechlorinate w/ferrous ammonium sulphate (0.141 N) 1 drop/mg/l Cl ₂ /250 ml. H ₂ SO ₄ to pH <2.
Cyanide/Thiocyanates	Dechlorinate if needed with ascorbic acid (0.6 g/l), 10 drops 10 N NaOH (to pH >12)/250 ml.
Dissolved Oxygen (D.O.)	Fixed on site.
Total Metals	2 ml 1:1 HNO ₃ /250 ml (to pH <2).
Dissolved Metals (Field Filtered)	2 ml 1:1 HNO ₃ /250 ml (to pH <2).
Microbiology	2 drops 10% sodium thiosulfate/125 ml to dechlorinate sample.
Oil & Grease	10 drops conc. H ₂ SO ₄ /250 ml (to pH <2)
Sulfides	10 drops 1M ZnAc/250 ml., 1 drop 10 N NaOH to pH 9/250 ml.
Base-neutral & Acid Extractables	Dechlorinate if needed with sodium thiosulfate (1 drop 0.141 N/mg/l Cl ₂ /250 ml).
Purgeable Organics	5 drops conc. HCl (to pH <2)

Samples preserved as required, cooled to 4 degrees Centigrade with chain of custody maintained.

Lab Letter Codes

- HT The recommended maximum laboratory holding time was exceeded before analysis.
- LC Laboratory conditions during analysis were not optimum (incorrect incubation conditions, equipment performance below normal, etc.).
- LP Quality control indicated that the precision of the result may have been less than normal.
- PS Possible interference may have affected the accuracy of the laboratory result.

Symbols

- < The substance, if present, is at a concentration below this value.
- Analysis was not done for this parameter.

NA Not applicable.

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